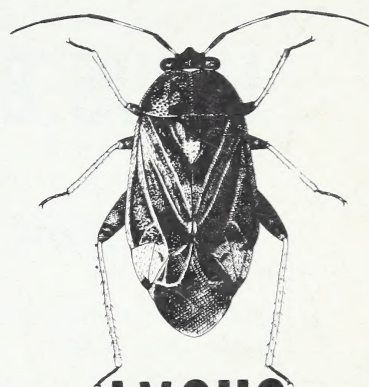


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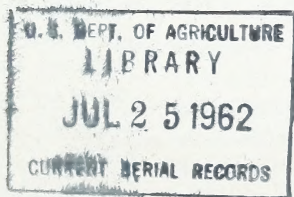
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LYGUS BUGS ON COTTON



*...How to
control
them*



LYGUS BUGS ON COTTON

. . . how to control them

Lygus bugs¹ are the principal insect pests of cotton in western areas of the United States; they are especially destructive where extensive alfalfa hay and seed crops are produced near cottonfields, and where large pasture areas dry up in early summer. In the South lygus bugs often become abundant on weeds and leguminous crops, and may move to nearby cotton and cause severe damage.

DEVELOPMENT

Lygus bugs develop in three stages—egg, nymph, and adult.

Female adults use their swordlike

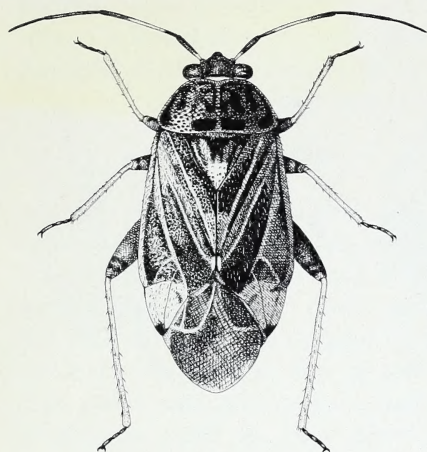
ovipositors to lay eggs in plant tissues, particularly in stems and leaf petioles. Eggs are tiny, elongate, and slightly curved.

Nymphs hatch from the eggs. They resemble adults in general appearance, but do not have fully developed wings; they can run rapidly, but cannot fly. They molt five times before becoming adults. The life cycle is completed in about 4 weeks in summer; it takes longer in other seasons.

Adults are flat and about one-fourth inch long. They range in color from straw green to dark brown, and have a conspicuous lighter colored triangle between the wings.

When disturbed by the cutting of a host crop such as alfalfa, or when the plants are no longer attractive as food, adults fly to another host crop; they can fly readily from field to field. They hide in plant foliage during the day when the weather is hot.

¹ *Lygus hesperus* is the predominant species in western areas; *L. lineolaris*, known as the tarnished plant bug, is prevalent in the South. Other species of lygus bugs damage cotton, but usually are of minor importance.



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Adult lygus bug.

HOST PLANTS

WESTERN AREAS

In western areas of the United States, lygus bugs may develop on weeds such as wild mustard. They develop large populations on alfalfa, especially when the alfalfa is grown for seed.

When lygus bugs infest an alfalfa hay crop, they have time to produce one generation between cuttings. The crop is cut several times in a season, and is a constant source of infestation for cotton.

An alfalfa seed crop requires at least 60 days before the seeds are mature and ready to harvest. This allows time for two or more generations of lygus bugs to develop in very large numbers. If not controlled they may destroy the entire seed crop.

Lygus adults leave alfalfa soon after a seed crop matures or a hay crop is cut. If cotton is growing nearby, the pests may move to it in large numbers

and gradually disperse over the entire cottonfield. If other alfalfa is growing in the vicinity, they may move into it in preference to remaining in the cotton.

SOUTHERN AREAS

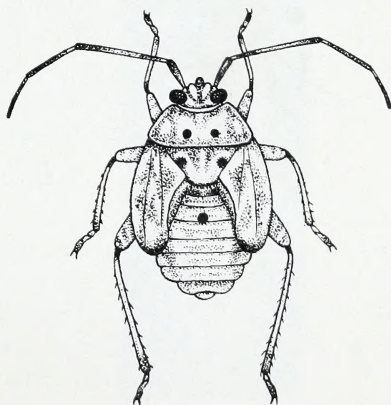
In southern areas, alfalfa and other legumes may serve as hosts for lygus bugs. Weed hosts, however, are more often responsible for the lygus populations that move to cotton.

The more important weed hosts are butterweed, fleabane, goldenrod, aster, and dog fennel. When weed hosts mature or become otherwise unsatisfactory for feeding purposes, lygus bugs usually migrate to cotton if it is growing nearby.

Weed hosts and alfalfa should be examined in time to detect and control lygus bug infestations before the pests can migrate to cotton.

DAMAGE

Lygus bugs feed by inserting their long, needlelike mouthparts into plant



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Lygus nymph in last molting stage.

tissues and sucking out the juices. On cotton, they attack the tender terminal growth, squares, flowers, and young bolls. Injured squares and small bolls usually drop. Injured bolls that do not drop may open abnormally and produce inferior lint that clings to the warty carpels that result from lygus feeding.

Lygus damage reduces the yield; it causes the lint to be spotted and lower in grade. Injured plants develop abnormally; they become tall and whip-like, and have fewer fruiting branches.

USING INSECTICIDE

When a damaging infestation of lygus bugs is present on cotton, the



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Lygus eggs in stem of cotton plant.

only way to control it is by applying insecticide. Two applications usually give satisfactory control; occasionally, three may be required.

WHEN TO APPLY

The Extension Service in each cotton-producing State issues an annual guide for controlling cotton insects. Start your insecticide applications when infestation reaches the level specified in your State guide. You can obtain a copy from your county agricultural agent or State agricultural college.

To determine the infestation level, make a sweep count at each of four or more locations in a cottonfield. You can accomplish this by making 50 or 100 passes with a sweep net through the tops of plants in 1 row in each location, holding the net so its lower edge slightly precedes its upper edge. Count the number of lygus bugs collected in the net, including the nymphs. Make the sweepings at 5- to 7-day intervals, beginning when squares start to develop on the plants and continuing until early September. When you know the number of lygus bugs a sweeping has collected, you can refer to your State guide to learn if it is time to apply insecticide.

Another method of determining the level of infestation is to walk diagonally across the field and examine 3 or 4 inches at the top of the main-stem terminals of 100 cotton plants, and count the lygus bugs, both adults and nymphs. These examinations should be made at the same intervals and over the same period as the sweep-count examinations.



Cotton square and bolls damaged by lygus bugs.

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INSECTICIDES AND DOSAGES RECOMMENDED FOR LYGUS BUG CONTROL

Insecticide	Amount of active ingredient to apply per acre in a dust or spray
CHLORINATED HYDROCARBONS:	<i>Pounds</i>
Aldrin.....	0.25 to 0.75
BHC (gamma).....	.3 to .45
DDT.....	.5 to 1.5
Dieldrin.....	.15 to .5
Dilan.....	1.5
Endrin.....	.1 to .4
Heptachlor.....	.25 to .5
Strobane.....	1 to 5
Toxaphene.....	1 to 5
ORGANIC PHOSPHOROUS COMPOUNDS:	
Dibrom.....	.5 to 1
Dylox.....	1 to 1.5
Guthion.....	.25 to .37
Malathion.....	1 to 2
Methyl parathion....	.25 to .37
OTHER:	
Sevin.....	1 to 2.25

SELECTION AND APPLICATION

The accompanying table lists insecticides recommended for control of lygus bugs, and gives rates of application. Consult your State guide before selecting the insecticide, as recommendations are different in different States. For example, Arizona reports that *Lygus hesperus* has developed resistance to DDT, and California reports that lygus bugs in general have developed resistance to all the chlorinated hydrocarbon insecticides.

Dusting

You may apply dust with ground equipment or aircraft. In either case, the rate of application should be 10 to 15 pounds of dust per acre in southern cotton-growing areas, or 20 to 30 pounds in western areas.

If you apply dust with ground equipment, use one nozzle for each row; set nozzles 6 to 10 inches above tops of the plants.

If you apply dust by airplane, limit the swath width to the plane's wingspan, or not more than 40 feet. Flag or mark the swaths to insure thorough coverage.

If the dust is likely to drift into fields of alfalfa or other crops that would be made unsalable by presence of a hydrocarbon-insecticide residue, apply Dibrom, malathion, or methyl parathion.

Dust applications are usually more effective if made in early morning or late afternoon. In desert regions, do not make applications after 10 a.m. or before 4 p.m.

Do not apply dust when wind velocity exceeds 4 or 5 miles an hour.

Spraying

Spray materials for use on cotton usually are formulated as emulsifiable concentrates. When mixed with water, they form emulsions that are easily applied with aircraft or ground equipment.

Before preparing a spray, determine the amount of spray your equipment dispenses per acre at a given speed. Mix the concentrate with enough water to insure that the proper amount of active ingredient will be applied to each acre. For example: If your spray machine delivers 8 gallons of spray per acre, and the recommendations specify 4 pints of concentrate per acre, you should mix 4 pints of concentrate with 7½ gallons of water to make 8 gallons of finished spray for each acre to be sprayed.

If you spray by aircraft, use nozzles that produce droplets of 100 to 300



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Damage to cotton plant that was exposed to lygus bugs for 7 weeks under a screen.

microns. Flag the flights; make swaths overlap. Do not spray by aircraft when wind velocity exceeds 8 miles an hour.

If you use a ground machine, one properly adjusted nozzle for each row will put enough spray on plants in the early fruiting stages to give control. When plants are larger, use two or three nozzles per row. Set the nozzles 6 to 9 inches above tops of the plants. Apply 2 to 10 gallons of spray per acre, at about 60 pounds pressure. Adjust dosage to the size of plants; largest plants require maximum dosage.

With ground machines, you can apply sprays effectively in winds up to 15 miles an hour.

BENEFICIAL INSECTS

Several insect predators destroy lygus bugs and help keep them under control. Some important predators in cottonfields are minute pirate bugs, striped collops, the big-eyed bug, and several species of spiders.

These beneficial insects are killed by the same insecticides that kill lygus bugs. Therefore it is important to apply chemical treatment only when lygus bug populations reach levels that require control.

PRECAUTIONS

Insecticides listed in the table are poisonous to man and animals. Follow directions and heed all precautions on container labels.

If you get insecticide on your skin or clothing, remove clothing and bathe with soap and water. As soon as you have finished using insecticide, bathe and change clothing.

Do not open containers in closed rooms. Do not leave metal containers

of emulsifiable concentrates in the sun.

Empty containers are particularly hazardous. Empty bags should be burned in the open, or buried. Liquid containers should be crushed and buried.

Do not apply insecticides where they can drift onto pastures being grazed by livestock. Dusts are particularly dangerous in this respect.

Protect food and feed crops from the drift of insecticides being applied for lygus bug control.

Avoid killing honey bees and other pollinating insects; make insecticide applications, if possible, during hours when bees are not visiting the plants. Take precaution against drift of insecticides into bee yards and adjacent crops in bloom. Notify beekeepers at least 48 hours before dusting or spraying, so that measures can be taken to protect the bees.

To protect fish and wildlife, be careful not to contaminate streams, lakes, or ponds with insecticides. Do not clean spraying equipment, or empty excess spraying material, near such water.

Controlling Lygus Bugs Plus Spider Mites or Bollworms

If spider mites are a problem in your area, apply a dust containing 40 percent or more of sulfur plus any of the insecticides recommended for lygus-bug control. Or, apply a dust or spray of any of the recommended insecticides plus a suitable miticide.

To control both lygus bugs and bollworms in areas where lygus bugs are

resistant to DDT, include DDT at dosages recommended for bollworms with any of the other insecticides recommended for lygus bugs except endrin or Sevin.

Your State guide lists mixtures of insecticides to use for the control of lygus bugs plus other pests.

The Extension Service in each cotton-producing State issues an annual guide for controlling cotton insects. You can get a copy from your county agricultural agent or State agricultural college office. If you are in doubt about the kind of cotton-insect control program to follow, consult your county agent.

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